'Different techniques needed' to detect fingermarks on new banknotes

June 3 2020

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Techniques used to detect fingermarks on traditional cotton banknotes are not effective on Scottish banks' new polymer notes and different methods are required, according to a study by University of Strathclyde

researchers.

Researchers from the University's Centre for Forensic Science and the Scottish Police Authority Forensic Services tested three techniques to determine which would work best on polymer notes owing to their non-porous fabric, which contrasts with the porous materials in cotton notes..

They discovered that the use of superglue fuming, followed by black magnetic powder, was found to be the most effective process for enhancement of fingermarks on all of the note types tested. Infrared light was the most effective light source for enhancing ridge detail on the fingermarks. This process has been found to be effective on polymer notes, in the same way that other processes were on cotton notes.

Uncirculated notes provided by the Royal Bank of Scotland (RBS) and Clydesdale Bank were used in the study, which is the first on the recovery of latent fingermarks from these types of polymer notes. The research was proposed by the Scottish Police Authority (SPA) and was carried out in its Forensic Services laboratories at the Scottish Crime Campus in Gartcosh.

The research has been published in the journal *Forensic Science International*.

Dr. Penny Haddrill, a Teaching Fellow in the Centre for Forensic Science, is a co-author of the study. She said: "The techniques used in this research are not new but different combinations of existing techniques were examined to find out which ones, and the order in which they were used, would be most effective for recovering fingermarks from polymer notes.

"This is a good example of Strathclyde research being put into practice, as the methods in the study are now being used operationally. It's also

part of our ongoing collaboration with the Scottish Police Authority Forensic Services, where many of our MSc Forensic Science students have carried out research work over the years."

Carina Joannidis led the study while an MSc student at Strathclyde and is now a Mark Enhancement Recovery Officer at Forensic Services SPA. She said: "With banks introducing polymer banknotes, it is important forensic scientists are able to continue to recover fingerprints from money seized under the Proceeds of Crime Act which has been used by convicted criminals in Serious and Organised Crime.

"This paper, written in collaboration with the University of Strathclyde, details effective ways to enhance fingerprints on new polymer banknotes so we can continue to serve the needs of justice in Scotland. Forensic Services work closely with Police Scotland, the COPFS and other partners to tackle the harm caused by serious organised crime for the people of Scotland."

The UK's Home Office carried out a fingermark detection study in 2016 on Bank of England notes but Scottish banknotes appear to have more textured areas and a less smooth finish. Notes worth £5 and £10 from both RBS and Clydesdale were examined in the Strathclyde study; they were separated into time periods of seven, 14, 21 and 28 days, to determine the effectiveness of each process on aged fingermarks.

Each of the fingermarks, provided by a group of donors, was given a score between zero and four for visibility. The scores across each series of 10 were then added together to give total scores out of 40, while each series was given a second overall score out of 10; this indicated how many of the 10 fingermarks gave a score of one or more and so contained any evidence of a fingermark.

The researchers aim to extend their study to cover £20 banknotes issued

by RBS and Clydesdale, as well as the Bank of Scotland's polymer notes.

More information: Carina Anna Joannidis et al, Determination of the most effective enhancement process for latent fingermarks on Clydesdale Bank and Royal Bank of Scotland £5 and £10 polymer banknotes, *Forensic Science International* (2020). DOI: 10.1016/j.forsciint.2020.110334

Provided by University of Strathclyde, Glasgow